Revisiting the history of stoma siting and its impact on modern day practice

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ABSTRACT

Research supports that appropriate stoma placement results in fewer postoperative peristomal skin complications and enhanced adjustment to life with a stoma. In this article, an international group of enterostomal therapy nurses look back at the history of stoma siting, originally called stoma location, to better inform and improve today's practice.

Keywords: Stoma siting, stoma location, stoma placement, history of WCET™ nursing, stoma nursing, ostomy nursing.

INTRODUCTION

Reflective practice is a hallmark of professional nursing and part of continuous professional development. Our ability to reflect on our daily practice and examine it in light of the current evidence (reflection for action) is the cornerstone of evidence-based practice (EBP), which is instrumental in the process of improving patient outcomes1.

A call to action

A review of practice invariably begins with someone asking a question of current practice; this review was no different. A question regarding the history of stoma siting was sent by email to the WCET™ Executive Board from the WCET™ International Delegate (ID) for Poland, Ms Magdalena Leyk.

“I would like to ask you for a little help. I am looking for some information about preoperative stoma site marking because I would like to do some research in Poland. I can’t find information of when the first site marking procedure was done. In Polish books and articles there is no information, in American journals, which I have access to, I could not find anything. If you would be so kind as to write me just the name of the person who wrote about it the first time and the year when it was first published, it would be very helpful for me; then I could find some articles, or research about it. I would be very grateful for your help.”

Ms Magdalena Leyk

Gathering the team

This request set in motion a series of emails. Thus began a search for an answer that brought together a team composed of members of the WCET™ Executive Board, the WCET™ Education Committee and the WCET™ Publications and Communications Committee. It is interesting to note that the WCET™ Education Committee has a task force led by Alison Crawshaw, that is in the final stages of producing an exciting team effort of practice reflection and an attempt to share knowledge to improve patient outcomes. So began our journey to discover the history of stoma siting while assisting a WCET™ member with her everyday practice.

“Dear (names redacted) and all WCET™ members,

I would like to thank you for this information and for your great involvement in my request. You are wonderful and I feel like a member of a thoughtful family. :) All this information is so interesting. I was asking you about this because I did some research about stoma care in Poland and in the results we discover we still have a problem with site marking. I decided to prepare another survey sent to stoma nurses (a bigger group), just about the procedure of site marking, to find where the problem is. In the beginning of this survey I wanted to add that this procedure is used around the world for a long, long time. That was why I asked about it, but reading your emails I feel like I have journeyed into the past. :) It was so exciting to read the long history about stoma site marking. I suppose the surgeon did the first stoma location and the procedure has evolved to current site marking (three position) over years, and the nurse was involved in it. You have a lot of information to write an amazing article about the history of stoma siting/stoma location. I hope that in the future maybe I could read your article about it. :) One more time, thank you very, very much for all your help ...

Kind regards, Magdalena”

THE WAY IT WAS — EARLY REFLECTIONS ON STOMA SITING

Stomas, or openings into the bowel, have been used in an attempt to save lives since 350 BC2. While surgical stomas were first mentioned in 1710 and the first successful attempt was in 1793, by Duret as a solution for imperforate anus3, a procedure for correct siting of abdominal stomas was not mentioned until 19784. The important procedure of stoma siting, originally the duty of the surgeon5, is today performed by a certified stomal therapist or enterostomal therapist (ET) in many developed and developing countries.

A personal reflection

Ms Prilli Stevens remembers her first encounter in caring for a patient with a stoma and reflects on the lack of siting and its consequences:

“In common with many stomaltherapy nurses I have a very vivid memory of my first exposure to a patient with an intestinal stoma. The year was 1958 and it was the third month of my nursing career at St Bartholomew’s Hospital, London. The sign on the single room door was very explicit — NO VISITORS — and behind that door lay an emaciated, tearful man about to have a dressing change following emergency surgery four days before for a toxic mega colon and long-standing ulcerative colitis.
The senior dressing nurse on the surgical unit asked me to come and assist her. The wound and stoma, at this time, were covered in a cellulose and cotton wool dressing and secured with a many-tailed bandage. On removal of the dressings, it was all I could do to restrain myself from expressing some horror, as the abdominal wall was a bright red colour — merged with silver aluminium paste and faecal material spurted forth from the phallic 2 inch ileostomy, sited low on the right abdomen. Our patient was deeply distressed and sobbed throughout the cleaning procedure. Within the hour a gentleman wearing a bowler hat, three-piece suit and carrying a leather suitcase arrived from Down Bros, the highly respected surgical appliance store in Welbeck Street, London, to ‘fit’ the patient with a stoma appliance. This consisted of a double-sided zinc-oxide plaster, a circular rubber flange and a rubber bag with an unscrewable plug on the side for drainage. The whole appliance was kept in place by a metal ring with two belt lugs and a rubber belt. Mr Percy Payne, the gentleman fitter, who I will never forget for his professionalism and skill, expressed concern at the site of the stoma, which compromised a snug, reliable fitting of the appliance. Indeed, should the patient be in any position other than lying flat he was sure that there would be a strong likelihood of leakage. The next few days bore out his concerns and the postoperative rehabilitation was greatly compromised by frequent leaks and changes. Unfortunately, a chance to re-operate and site the stoma in a better position were out of the question due to the poor nutritional state of our patient at this time.

I will fast forward six months and simply say that that particular patient eventually made a wonderful recovery from the surgery and gained over a stone in weight, which of course made the stoma care even more complex with the change in his body contour. Reluctantly, he underwent a resite of the ileostomy with the surgeon a wiser man, having seen first-hand the problems and the angst a poor site can produce. The patient returned to a full and highly successful life as a famous musician travelling the world and entertaining thousands with confidence and continence."

Priscilla J d’E Stevens

AN INSIGHT INTO THE HISTORY OF STOMA SURGERY

The early years — 1700s

Dorothy B Doughty wrote about the history of stoma surgery in her manuscript published in the Journal of Wound, Ostomy and Continence Nursing in 2008. She highlights the initial challenges of stoma location in an era highlighting advancements in surgical practice and survival, without much consideration for the patients’ quality of life.

The first reported colostomy in 1710 was located in the groin area, on the patient’s left side. Later stomas were raised in the lumbar region. It is difficult to imagine how patients managed to self-care and lead any sort of life, especially when you consider the lack of modern appliances. Although surgical techniques have advanced and the work of pioneers such as Norma N Gill, along with innovative industry solutions have improved stoma care in relation to sitting and pouching, we still see stomas incorrectly sited with no standardised technique.

How gold standard has been fixed — 1950s–1990s

The reason that early reference to stoma siting appears to be missing is because in early papers and articles, this activity was referred to as stoma location or stoma placement in early papers and articles. The first reference found was 1967, in the excellent Atlas of Intestinal Stomas authored by Doctors Rupert Turnbull and Frank Weakley of the Cleveland Clinic. Ira Kodner (another Cleveland graduate) published a booklet in 1978 on colostomy and ileostomy care, including the importance of stoma location and planning. However, the best enterostomal therapy nursing early references came from the excellent pioneering ETs of the USA: Rosemary C Watt, ET from Stanford University Hospital of San Francisco, California. She wrote the definitive article on Stoma placement in principles of ostomy care, published in 1982. In this first stomatherapy text, there is a description in the preoperative care chapter that demonstrates several diagrams showing various siting techniques. This book was our ET “bible” for many years. It was still available for ETNEPs in 1991, but unfortunately has been out of print since the early 1990s.

The next textbook was written by Beverly Hampton and Ruth Bryant in 1992. Cited in this book is an article written in 1979 by Victor Braren and colleagues discussing the use of the umbilical area for placement of urinary stomas.

However, it was only when Norma N Gill set the stoma world alight with her observations and suggestions following her own surgery, that siting preoperatively became common practice. Initially performed by surgeons, stoma siting eventually becoming an integral part of the ET nurse’s role.

According to Prilli Stevens: “We can never divorce the hole from the whole” and in all matters concerned with enterostomal therapy nursing it should be appreciated that as an entity it was only introduced as a concept in 1958 — when our founder Mrs Norma N Gill was appointed as an “ostomy technician” to the colorectal service at the Cleveland Clinic Foundation, Ohio, USA. In 1961, an education program was established at the Cleveland Clinic. The initial trainees under Mrs Gill were themselves rehabilitated ostomates drawn from the various ostomy chapters (patient self-help groups) in the USA. Therefore, although members of the colorectal ostomy rehabilitation team were highly respected, it would be highly unlikely that surgeons would defer the responsibility of preoperatively selecting a stoma site to an otherwise unqualified “lay ostomate”.

It was not until 1961 that the concept of creating a specialised nursing role was recognised by the Ferguson-Droste-Ferguson Hospital in Grand Rapids, Michigan, USA. In
tandem with this, the Cleveland Clinic, Ohio, USA, opened their ET program to trained nurses. Over the following eight years, these trainees formed a national body and established five educational programs with 351 graduates. Also in the 1960s, other key areas of the globe such as England at St Bartholomew’s Hospital in London, France at the Hotel Dieu in Lyon, Australia at the Alfred in Melbourne and Sweden at Salkenska in Gotenborg, other eminent colorectal surgeons had also identified and seconded senior nursing staff to specialise solely in the care of persons with ostomies or fistulae. Thus, a whole new speciality of nursing emerged. This new role addressed preoperative counselling and orientation or stoma siting and practical skills and procedures.

In the education programs developed by the excellent stomaltherapists of the Cleveland Clinic, specifically Joan Kerr and Joan Van Niel, the correct procedure for undertaking preoperative stoma placement was documented and taught. The same work was accomplished by the pioneers in the other countries mentioned, such as Barbara Saunders in the UK, and so ET programs became well established and the next generation of ETs taught the correct siting protocols.

**SITING METHODS AND CHALLENGES**

In the beginning there was much trial and error in stoma siting. From personal experience, there is nothing more distressing than marking the chosen site carefully then receiving the patient postoperatively with another site used by the surgeon. This might be due to preoperative scrubbing and towelling by the theatre staff that completely removed the indelible mark. This led to the development of a variety of alternative marking methods. One example is the placement of an adhesive red dot covered by a transparent waterproof dressing or tattooing the site with a Hagedorn needle once the patient was anaesthetised.

At the Cleveland Clinic, Dr Rupert Turnbull established special metal marking tools which were placed on the abdomen, especially in the emergency surgery situation when an ET had not met the patient preoperatively. Some of us were lucky to actually watch him siting an acute abdomen in the anaesthetic preparation room with these circular discs as his guide. He was of the opinion that all acute abdomens should be sited prophylactically. These three discs are still used today, even if they are made of plastic now (Figure 1).

**Ostomy irrigation**

In the early years following formation of a sigmoid colostomy, it was common practice to teach colostomy irrigation, with the wearing of a protective pad between irrigations rather than a colostomy pouch. Remember that the age of plastic disposables only came in the late 1960s. An ideally sited stoma would not have been so crucial, as pouching was not necessary.

“In 1975, I was introduced to the strict routine of the Cleveland Clinic colorectal service of siting ALL emergency abdominal surgery for a potential stoma by Professor Turnbull himself. He demonstrated taking a metal circular disc with a hole punched in the middle to the anaesthetic preparation room and even with distended abdomen and the patient only in the recumbent position, the major parameters were noted and the disc placed in the best site he could identify at the time — and marked with an indelible pen. Once anaesthetised, and prior to the preparation of the abdomen for surgery, the mark was further scratched with a blade prior to cleaning and towelling. In the same year I was fortunate to visit and work alongside another ‘great’ — Rosemary C Watt of the Stanford Clinic in San Francisco. Her excellent unit proudly carried out the very best of stoma caring and had a picture of ‘the perfect stoma ... well sited — well mobilised — well perfused — well fixed’ above the desk ... bearing in mind the need for all the residents
to be aware of the difficulties for all concerned should the site be inadequate. In Toronto, where Dianne Garde ruled with a very experienced rod of iron, junior surgical interns were encouraged to wear an ostomy pouch for a couple of days with either porridge or water in them. If the site chosen to fix the pouch was inadequate, leakage would occur … thus a great lesson was learnt.”

Priscilla J d’E Stevens

Some of the WCET™ Executive Board members remember the “bad old days” of stoma siting and stoma construction.

Devices to keep the bowel on the abdomen

“Reflecting back, the “good old days” were not always so good. In 1972, some of the surgeons were still using DeMartel clamps to create the stoma. The surgeon would pull the bowel up through the incision to two inches or so above skin level, a DeMartel (or similar) (figure 2) was clamped onto the bowel near skin level; petrolatum gauze was wrapped around the bowel and clamp; the bowel would necrose and the clamp would fall off. Whilst the clamped bowel was necrosing, there was a very unpleasant odour of decomposing flesh. This approach was very crude. Additionally, the stoma sites were not carefully selected before surgery. They were located more for surgical convenience. When the clamp finally fell off, the resulting stoma was essentially a hole at the skin level, or slightly recessed, that was often difficult to pouch.

Loop stomas were held above skin level using various devices, some self-made and others (rods and bridges) commercially made (figure 3).”

Susan Stelton

Figure 2: DeMartel Clamp

In 1884 goose quill bridges were utilised to keep the nipple above skin level in loop stomas. According to John M MacKeigan and Peter A Cataldo, in 1888, Maydl first suggested an external appliance to support a loop stoma. Since that time hundreds of modifications have been used, including goose quill.

Surgeons then moved onto makeshift devices such as glass rods and rubber tubing, creating unique pouch application challenges. Modern surgeons still use homemade devices, but fortunately choose flexible plastic tubes, sewn close to the stoma to allow the wafer to slide underneath and protect the skin, or do not use a bridge at all.

Figure 3: Stoma support devices (rods, bridges)

We should remember that as important as preoperative stoma siting is, just as crucial is stoma construction. This construction is not always achieved even today (Figures 4, 5, 6 and 7). It may depend on abdominal wall thickness and contours. It would have major impacts on stoma management and most of all on the patients’ quality of live.

TODAY’S PRACTICE

In most countries, certified experienced stoma therapists or ETs perform stoma siting; this is an important competency for ET education programs. Although some countries where legislation does not allow this, require that the surgeon perform siting, which may also be necessary in an emergency, making it an important competence for Colorectal Surgery Fellowships.

WCET™ International Ostomy Guideline

In the WCET™ International Ostomy Guideline (IOG), section 3.1 Preoperative care needs, pages 10–11, there are two recommendations for stoma site marking. They are:

3.1.1 Stoma site marking on the summit of the infraumbilical mound, within the rectus muscle away from abdominal scars, creases, skin folds, or belt line should be done preoperatively for both elective and non-elective (when possible) surgery by an ET nurse or clinician educated in ostomy care. Strength of Evidence (SOE) = B+

3.1.2 Preoperative education for both the patient and the family (when possible) should include stoma explanation and site marking, the surgical procedure, and postoperative stoma management. SOE = B+25, pages 10–11

A special page is also dedicated to stoma siting recommendations in section 5, page 34.

The rise of the stoma therapist/ET

It took time and experience for the message to get through that one had to think not only about the type of surgery
and the planned incision but also that the patient should be sited, having been assessed in three positions: sitting lying and standing. Good communication between the ET nurse and the surgeon preoperatively was also required. In some countries, surgeons found it difficult to treat the specialist nurse as a colleague with skills able to carry out the task of siting! Seeing the ET as an experienced colleague rather than a handmaiden has taken time in some countries.

The early ET in many instances was the surgeon himself. It was only by time in the role that appreciation of the many vagaries that could influence a chosen site were recognised. Weight loss preoperatively and subsequent gain on restoration of health, existing orthopaedic status, with kyphosis and/or scoliosis, prosthetic limbs, wheelchair-bound ostomates, some requiring further surgical incursions and potential external beam radiation are all considerations required by the nurse doing the stoma siting.

Siting for two stomas was noted to require extra considerations. This included the use of a belt to ensure security for the urinary diversion, whereas many colostomies in the early years utilised colostomy irrigation rather than pouching. Other stomas formed at several different levels of the gut required siting as well. Thus cervical oesophagostomy, gastrostomy, jejunostomy and caecostomy, and some intra-abdominal drainage sites were noted to benefit from preoperative siting. Although in many situations these stomas have not always received the attention they require and failed to be sited, adding to the difficulties for all concerned.

The majority of pioneering ET nurses were not prone to writing papers! They were totally immersed in becoming team members and taking on more and more clinical responsibility as their talents emerged and practice roles grew. Sub areas of expertise emerged and paediatric stoma care, oncology and inflammatory bowel disease, trauma stoma nursing and the management of complex fistulae and open abdomen have called on knowledge and understanding in order to efficiently plan the stoma site.

Gunshot wounds, external fixations frames, open abdomen, multiple fistulae, necrotising fasciitis and chemical burns all require individualised and multidisciplinary discussion prior to siting. Interesting work studying bowel motility following spinal cord injury as a combined study by ETs and spinal cord teams have led to individualised stoma sites being selected dependent on the point peristalsis ceases. The assumption that stomas of the sigmoid colon suit all
spinally compromised persons falling away once the study demonstrated contrary information27.

**Modern day stoma sitting**

The benefit of placing a mark at the site of the stoma preoperatively is twofold. Firstly, to ensure that a flat surface is identified during lying, sitting, standing and bending at the waist in both sitting and standing positions, in order to avoid leakage. Secondly, it is also to ensure that the patient is in agreement with the site in relation to being able to self-care and make decisions related to lifestyle and clothing.

Whenever possible, the aim is to raise the stoma at the centre of a flat surface (so it can accommodate the size of the wafer) and be through the rectus abdominis muscle, which provides a firm support. The stoma also must be in a place where the patient can see it to do self-care, and where the appliance can be hidden under clothing.

There are several factors that need to be elicited before stoma site marking that may affect the stoma site or warrant a discussion with the patient about adaptation. The diagnosis, type of surgery, stoma and abdominal wound will provide information regarding anatomical placement of the stoma and also avoidance of the planned wound. Age, fashion, occupation, lifestyle, disability, physical or mental impairment, and religious beliefs are all factors that may influence stoma positioning, self-care and adaptation.

The technical process is performed in light of this holistic assessment. There are many sites that must be avoided or acknowledged and discussed. Consider the following:

- Observe patient in usual clothes in sitting and standing positions to ascertain waistband, belt or brace placement, type of undergarments.
- Ask patient to lay flat and straight, exposing abdomen and ensuring that the abdominal contours are not affected by clothes.
- Observe scars, skin folds, hernia, skin mounds, wrinkles, bony protuberances, umbilicus, radiation sites, loose skin and hernia, pendulous breasts and abdominal aprons.
- Ask the patient to cough, while palpating the abdomen in order to locate the rectus abdominis muscle. Once identified, ask the patient to raise their head (which will tighten the muscle) making the lateral border easier to identify.
- Place a mark with a pen at the flattest possible site within the rectus muscle.
- Ask the patient to sit upright, sit reclining, sit as they would while relaxing, stand, bend forward, bend to the right, bend to the left and lie down. If cultural issues require kneeling and bowing, then ask the patient to kneel and bow as they usually would. Work with the patient to ensure all possible positions have been checked in accordance with their occupation and lifestyle.

- In all positions, check that body contours and that the proposed site is still at the centre of the flattest surface.
- Gently grasp any skin folds between thumb and forefinger and ask patient to straighten the abdomen, avoid overhangs and aprons.
- Mark an area that is as flat as possible in these positions and is visible to the patient. This mark should be approximately 2 inches (5 cm) away from bony prominences, scars, creases, skin defects, waistline and midline, as well as being on a flat, even abdominal surface within the patient’s visual field.
- Confirm with the patient that they can see the stoma and that it is in an area that they feel they can live with.
- Mark the area with indelible pen with a filled-in circle and cover pen mark with film dressing.
- If the patient is to receive pelvic radiation the site must be above the anterior superior iliac spines.

**SUMMARY AND CONCLUSIONS**

A poorly located stoma may result in pouching problems, increase the potential for leakage, and place undue hardship and emotional trauma on the patient28–30. Yet Pittman found up to 67% of stomas were not marked preoperatively31. This underscores the importance of proper location of the stoma.

The technique for appropriate stoma siting can be found in the newly released WCET™ educational resource on ostomy siting available on the website at www.wcetn.org. This newest WCET™ creation is the result of a task force led by Alison Crawshaw32. In addition, a dedicated webinar on stoma siting has been published and posted on the WCET™ website.

Preoperative stoma siting, based on these best practice principles (including how to adapt to individual patients) is recognised as a crucial competence in specialised training programs. The WCET™, via its Education Committee, Twinning projects, and Congress Travel Scholarships aims to promote these specialised skills to prevent ostomates suffering with poorly sited stomas.

Much has been achieved since the early days of stoma surgery, but siting remains a challenge which impacts on the patient quality of life. Reflection within interdisciplinary, collaborative teams is important to successful coordination1. This can be demonstrated by projects such as enhanced recovery after surgery (ERAS) programmes33,34. These trends in surgery and patient care continue to provide challenges for stoma therapists, including preoperative siting. Therefore, it is important that we continue to review and improve practice to meet these challenges.
A FINAL WORLD FROM WCET™ LIFE MEMBER, MS PRILLI STEVENS

“Finally, I would like to commend the early ostomy chapters in the USA and the UK for initially supporting each other during the difficult times prior to formal professional specialised care. By forming provincial and then national bodies and creating awareness of the plight of ostomates and appraising their surgeons of the problems they encountered. The pioneering of the International Ostomy Association, with Mr Archie Vinitsky at the helm in 1975, was a watershed moment. It was in London at their second meeting that those first pioneering nurses met to form the idea of our international ET nursing body, the WCET™. On a personal note, I would dedicate this reminiscence to the many hundreds of ‘poorly sighted’ ostomates from the past and those who in 2017 still suffer the problem of leakage and odour, sore skin and loss of confidence and dignity due to failure to appreciate the need for a good site. On the positive side, how wonderful it is to have a global body sharing the importance of preoperative siting and I salute the WCET™ for the continuing quest to promote this procedure.”

Priscilla J d’E Stevens

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Thank you to all the co-authors for their contributions. This manuscript tells a lot about our global ET family, the WCET™. Next year we will celebrate our 40th anniversary: what a fantastic way to celebrate it by showing what this working team project was able to achieve!

AUTHORS’ DISCLOSURE

The authors disclose that they have no conflicts of interest.

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